

# Exhibit E

UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF VIRGINIA  
ALEXANDRIA DIVISION

United States of America, *et al.*,

Plaintiffs,

v.

Google LLC,

Defendant.

Case No. 1:23-cv-00108-LMB-JFA

Hon. Leonie H. M. Brinkema

**EXPERT REBUTTAL REPORT OF ROBIN S. LEE, PHD**

**February 13, 2024**

Expert Rebuttal Report of Robin S. Lee, PhD

competitive constraint to prevent Google (or a hypothetical monopolist) from exercising significant market power over publisher ad servers, ad exchanges, or advertiser ad networks for open-web display advertising. [REDACTED]

#### **IV.A.2. Assessments of substitution among ad tech products at prevailing prices can succumb to the “Cellophane Fallacy”**

(72) [REDACTED] However, as is commonly understood by economists, assessing substitutability between products for the purposes of market definition when it is possible that prevailing prices already exceed competitive prices risks overstating the significance of more distant substitutes.<sup>117</sup> This is because at elevated prices, customers would more likely substitute to alternatives that would not otherwise have been close substitutes at more competitive prices. Ignoring this point is commonly known as the “Cellophane Fallacy,” and can lead to markets that are misleadingly broad for the purposes of evaluating market power.<sup>118</sup>

(73) Dr. Israel argues [REDACTED]. Although customer substitution is important to consider, for the purposes of the HMT, it is substitution at competitive price levels that informs whether a hypothetical monopolist can exercise market power. When there is valid concern (and direct evidence) that prices for products have already been subject to the exercise of significant market power, there are categories of evidence other than substitution patterns at prevailing prices that inform whether a market contains enough close substitutes to pass the HMT.<sup>120</sup>

---

<sup>116</sup> Lee Initial Report, ¶ 247 [REDACTED]

<sup>117</sup> Lee Initial Report, ¶ 251 (“[C]ontrast, for monopolization claims, the HMT considers customer substitution patterns at the benchmark of competitive prices. This is because an important concern is that *prevailing prices may already reflect the exercise of substantial market power by the alleged monopolist*. At such elevated prices, consumers would likely substitute away from the alleged monopolist’s products to alternatives were the alleged monopolist to impose a further price increase—even if those alternatives are not close substitutes for the alleged monopolist’s products *were the monopolist’s products priced more competitively*. When there is a concern that prevailing prices (or product qualities) depart significantly from those that would otherwise obtain in a more competitive environment, relying on observed customer substitution patterns at existing price or quality levels risks overstating the competitive significance of more distant substitutes that customers only turn to after a set of products has already been monopolized.”). (emphasis in original).

<sup>118</sup> Lee Initial Report, n. 340.

<sup>120</sup> Lee Initial Report, ¶¶ 253–254.

Expert Rebuttal Report of Robin S. Lee, PhD

(74) Nonetheless, Dr. Israel attempts to dismiss these concerns. [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]

(75) Dr. Israel also states that [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]

[REDACTED]. This error in this logic can be seen by considering the *DuPont* case in which the “Cellophane Fallacy” terminology originated.<sup>125</sup> In that case, the Court found that buyers viewed non-cellophane wrapping materials as close substitutes at prevailing, supracompetitive prices, which would likely not have been the case at more competitive prices.<sup>126</sup> Though their presumed objective of wrapping their products the most efficient way possible would not change with relative prices, the choice of a particular wrapping material would. Similarly, even though advertisers generally try to attract the attention of users regardless of the relative prices of different forms of advertising, their choices among different forms of advertising tools—and thus observed substitution patterns—are impacted by their relative prices.

(76)

[REDACTED]  
[REDACTED]  
[REDACTED]

---

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

<sup>122</sup> See Lee Initial Report, § V.

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

<sup>125</sup> *United States v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377 (1956).

<sup>126</sup> Gene C. Schaerr, “The Cellophane Fallacy and the Justice Department’s Guidelines for Horizontal Mergers,” *Yale Law Journal* 94 (1985), n. 52 (“Recall that the prevailing price for cellophane was arguably supra-competitive, and that at that price consumers regarded a number of other flexible wrapping materials as good substitutes for cellophane...If consumers regarded these other products as good substitutes for cellophane at the prevailing, supra-competitive price, then they probably would not have regarded them as good substitutes if cellophane were priced competitively.”).

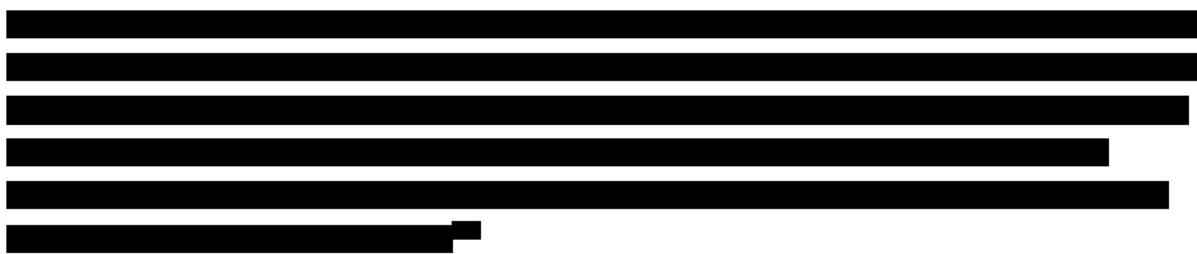
[REDACTED]  
[REDACTED]  
[REDACTED]

## Expert Rebuttal Report of Robin S. Lee, PhD

I may be in some sense “multihoming” across types of tools—but this is not because they are necessarily substitutes. Even though on some jobs they may be (imperfectly) substitutable, I have them both in my toolbox because each is well-suited to a particular type of job. To take another example, many people own both a smartphone and a television—that is, they “multihome” on devices with digital screens. But although one can watch a movie on both devices (and hence they are imperfect substitutes for some tasks), this does not mean that a hypothetical monopolist of televisions would necessarily be constrained from charging higher than competitive prices by customer substitution to smartphones.<sup>131</sup>

- (82) Thus, multihoming itself does not alone provide conclusive evidence of substitution between products.<sup>132</sup> One must also consider the reason for the multihoming before attempting to reach such conclusions. If multihoming occurs because one needs multiple tools that serve different functions, then multihoming can be consistent with a *lack* of substitutability.

(83)



- (84) In summary, multihoming is not “binary”—for understanding whether observed multihoming behavior across products is indicative of those products being substitutes, it is important to also consider:

- The extent to which products provide different functionalities to customers. For example, as I discussed in my initial report and below in Section IV.E, some large advertisers use both Google

---

<sup>131</sup> As yet another example, I may buy a bag of potato chips in a given week from both a grocery store and a gas station—thus, in a sense, “multihoming” across food stores. But if I suddenly could not access a grocery store, my ability to shift my food spending to gas stations will be limited.

<sup>132</sup> I discussed this issue in my initial report with respect to different forms of digital advertising Lee Initial Report, ¶¶ 285–289. In my initial report, I also noted that increased multihoming and switching costs can damage competition and efficiency because it makes “more costly for customers to move away from a given firm’s products or to use rivals’ products in addition” in the event that a firm attempts to exercise market power (Lee Initial Report, ¶ 190). Note that in this discussion, customers may choose to multihome *because they are substituting* to alternative products when faced with higher prices. However, this discussion does not mean that *all* observed instances of multihoming arise from substitution.

<sup>133</sup> I also understand that Prof. Hoyer has [REDACTED] (see generally Hoyer Report, § III). With respect to this question, I understand Prof. Hoyer concludes that [REDACTED]

[REDACTED] See Hoyer Report, § III.E.

Expert Rebuttal Report of Robin S. Lee, PhD

not mean tools that do not transact open-web display advertising must be contained within the same relevant antitrust market as publisher ad servers, ad exchanges, or advertiser ad networks that do.

- (88) For instance, the rise of air travel displaced some amount of train travel, but today airline markets are routinely analyzed excluding trains or other forms of transportation because they serve distinct purposes, even though some consumers may use both at different times. Similarly, the displacement of “feature phones” and landline phones by smartphones does not mean that a smartphone market alone would not pass an HMT.

#### **IV.A.6. Dr. Israel fails to rebut the role of direct evidence of market power for establishing relevant markets**

- (89) In this case, Google has exercised significant market power in each of the relevant product markets that I discussed in my initial report—publisher ad servers, ad exchanges, and advertiser ad networks for open-web display advertising—without causing enough substitution to alternative products to make such an exercise unprofitable. Direct evidence of this behavior indicates that these are relevant product markets: because Google was able to profitably exercise market power over these products despite the possibility of substitution to alternative products, a hypothetical monopolist that controlled Google’s products as well as rival products in the market would also find it profitable to do so.<sup>138</sup>
- (90) I discussed this direct evidence in my initial report,<sup>139</sup> and also provide more discussion—[REDACTED]—in Section V below.
- (91) Direct evidence of Google’s substantial market power within the relevant markets leads to two additional implications. First, it indicates that Google can charge quality-adjusted prices significantly above competitive levels, even without precisely specifying what those competitive levels are. This is useful because competitive prices are typically difficult to ascertain in markets that have already been monopolized, or subject to the exercise of significant market power by market participants, for an extended period of time. Second, it also demonstrates that potential constraints imposed by indirect network effects do not prevent Google—or a hypothetical monopolist within each market—from charging quality-adjusted prices above competitive levels.<sup>140</sup>
- (92) In response to the above, Dr. Israel asserts that [REDACTED]  
[REDACTED]  
[REDACTED]

---

<sup>138</sup> Lee Initial Report, ¶ 254.

<sup>139</sup> Lee Initial Report, § V.

<sup>140</sup> Thus, Dr. Israel is incorrect in claiming [REDACTED]

[REDACTED] See also, Section III and Lee Initial Report, § III.B and n. 239.

Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED]. First, for the purposes of market definition, it is sufficient to show that a hypothetical monopolist that owned all products would likely possess enough market power to profitably implement a SSNIP; establishing that only one participant possesses monopoly power, which is a higher bar and generally associated with substantial and sustained market power protected by significant barriers to entry, is not a necessary criterion for defining a relevant product market.<sup>142</sup> Second, the direct evidence I provide does indicate that Google possesses substantial market and sustained market power in the relevant markets at issue (see Section V below), and is thus more than sufficient to satisfy the HMT.

#### **IV.B. Open-web display advertising is a distinct and important form of advertising for publishers and advertisers, indicating that customer substitution would not constrain the exercise of market power in the relevant markets**

- (93) In my initial report, I defined relevant product markets for *publisher ad servers*, *ad exchanges*, and *advertiser ad networks*.<sup>143</sup> Each of these product markets contain *ad tech tools* that are used to transact open-web display advertising. In these transactions, Google or other ad tech intermediaries are sellers, and there are two sets of distinct customers: advertisers (on the demand-side) and open-web publishers (on the supply-side).<sup>144</sup>
- (94) I also discussed why—even though these relevant product markets do not contain the underlying display advertisements themselves, and are thus distinct from a hypothetical product market containing *open-web display advertising*—it is still nonetheless useful to examine how open-web display advertising is an important and distinct form of advertising from the perspective of advertisers and publishers.<sup>145</sup> Such analysis is informative because its clarifies why products that facilitate open-web display advertising transactions are particularly valued by open-web publishers and advertisers, and why products that do not facilitate such transactions are not close substitutes.<sup>146</sup>
- (95) This distinction between the underlying display advertisements and the ad tech tools that facilitate their sale is important. One reason is that a firm that monopolizes parts of the ad tech stack can create a bottleneck and exercise market power even if there is a meaningful amount of digital advertising

---

[REDACTED]

<sup>143</sup> Lee Initial Report, § IV.

<sup>144</sup> Lee Initial Report, ¶ 52.

<sup>145</sup> Lee Initial Report, § IV.B.

<sup>146</sup> Lee Initial Report, ¶ 245.

## Expert Rebuttal Report of Robin S. Lee, PhD

flowing through other channels. Focusing on types of advertising and not the underlying tools obscures the potential for competitive harm.

- (96) Another important reason that the distinction between display advertisements and the underlying ad tech tools matters is that the amount of substitutability between open-web display advertising and other forms of advertising that would be required to constrain a certain percentage increase in fees for an ad tech tool is different, and can be much greater, than the amount needed to constrain the same percentage increase in the price of open-web display advertising.

(97) To see why, observe first that ad tech fees represent only a portion of the total cost of open-web display advertising. This implies that any percentage increase in ad tech fees results in a smaller percentage increase in the overall cost of open-web display advertising. As an example, consider of an advertiser who pays \$100 for an open-web display impression through an ad exchange which charges a 20% take rate (so that the publisher receives \$80). If the ad exchange increases its take rate by 5% (going from 20% to 21%), then even if the fee increase was completely borne by the advertiser so that publisher payout remained fixed at \$80, the advertiser's cost would only increase from \$100 to \$101.27 (all else equal), representing a 1.3% increase in the price of advertising.<sup>147</sup>



$$^{147} \$101.27 = \$80 \div (100\% - 21\%).$$

Expert Rebuttal Report of Robin S. Lee, PhD

He does not assess the extent [REDACTED]  
[REDACTED]  
[REDACTED]

(101) Neither Dr. Israel nor Dr. Ghose [REDACTED]  
[REDACTED]  
[REDACTED]

(102) To illustrate one reason this is unlikely, consider Figure 4, which contains Semrush's calculation of the average CPM for various ad types and platforms.<sup>152</sup> As I described above, an increase in ad exchange fees from 20% to 21% (representing a 5% increase *above already elevated levels*), *even if borne completely by advertisers*, would increase ad prices by 1.27%.<sup>153</sup> Based on the reported estimates in Figure 4, a 1.27% increase would raise the average CPM of desktop display ads from \$2.50 to \$2.53, still well below the cost of other forms of advertising. For example, the average CPM of social display ads in Figure 4 is \$5.50: \$3 (or 220%) more than desktop display. Dr. Israel and Dr. Ghose fail to explain [REDACTED]  
[REDACTED]  
[REDACTED]

---

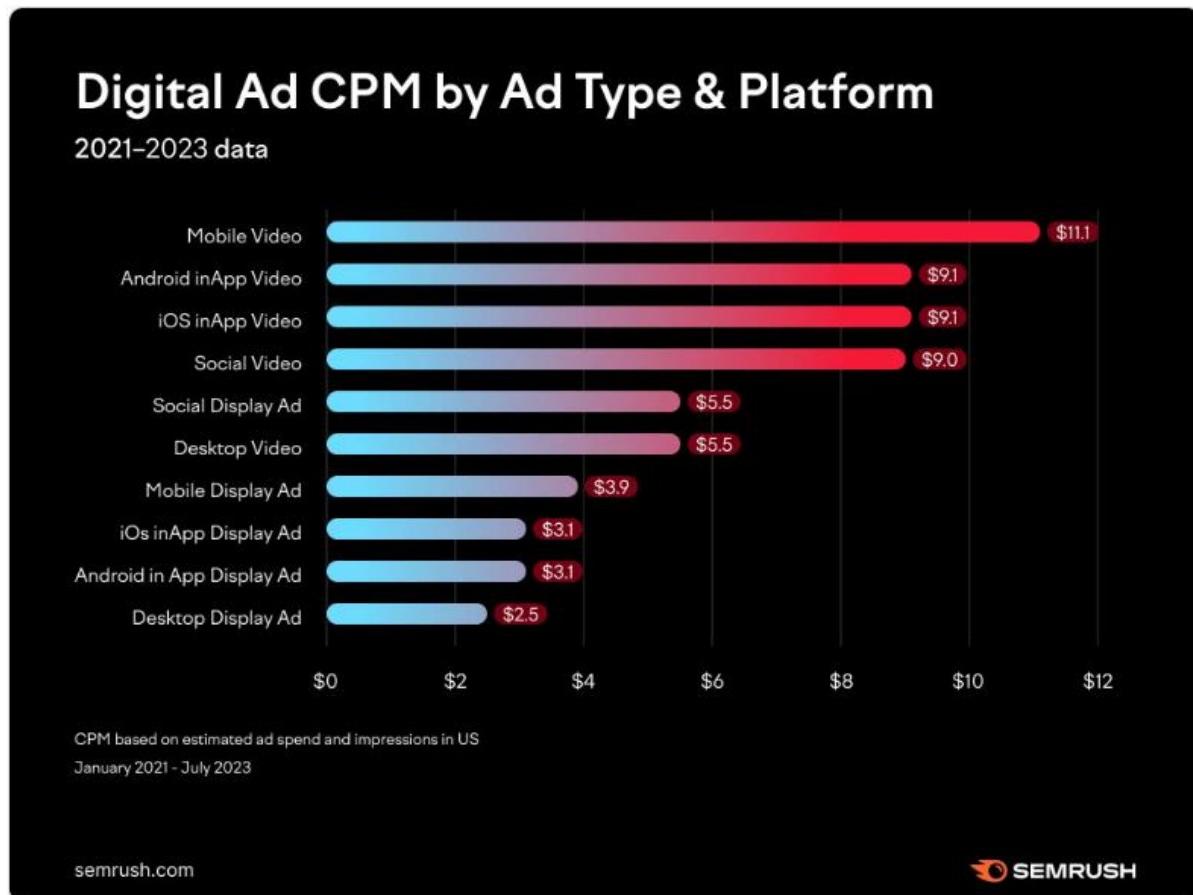
[REDACTED]  
[REDACTED]

<sup>152</sup> Semrush is “a leading online visibility management SaaS platform that enables businesses globally to run search engine optimization, pay-per-click, content, social media and competitive research campaigns and get measurable results from online marketing.” Business Wire, “Semrush Holdings, Inc. Announces Investor Conference Call to Review Fourth Quarter 2023 Financial Results,” Business Wire, March 5, 2023, <https://www.businesswire.com/news/home/20240206729468/en/Semrush-Holdings-Inc.-Announces-Investor-Conference-Call-to-Review-Fourth-Quarter-2023-Financial-Results>.

<sup>153</sup> As I explain in Sections III, IV.A.3, and IV.B.1, it is unlikely that an increase in ad exchange fees would be borne completely by advertisers given the lack of close substitutes on the publisher side. To the extent some portion of the increase in fees was borne by the publisher, the increase in ad prices would be lower than 1.27%.

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

**Figure 4. Semrush analysis of “Digital Ad CPM by Ad Type & Platform”**

Source: Luke Harsel, “Advertising Trends: CPM Benchmarks by Industry [Study],” *Semrush*, October 23, 2023, <https://www.semrush.com/blog/advertising-cpm-benchmarks-study/>

- (103) Google’s experts also erroneously claim that [REDACTED] However, this again misses the distinction between tools that transact advertising, and the underlying advertising itself. The relevant product markets contain those tools (publisher ad servers, ad exchanges, and advertiser ad networks) that transact open-web display advertising; such tools can also transact other forms of advertising, including direct deals, in-app display, and instream video ads. A product is only excluded if it cannot transact open-web display ads.<sup>156</sup>
- (104) What Google’s experts appear to argue (albeit not very clearly), but fail to support, is that [REDACTED]

<sup>155</sup> See discussion in Section IV.B.2.c.

<sup>156</sup> In my market share calculations, I restrict attention to open-web display transactions even if some of these products may transact other types of digital advertising.

Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED] As I have discussed at length above and in my initial report, this is not true.

- (105) In the rest of this Section, I respond to points raised by Google's experts regarding [REDACTED]

[REDACTED] The discussion at times will focus on the underlying display advertisements, even though (again) the products within the relevant markets are ad tech tools. I also describe why indirect transactions for open-web display advertising also provide distinct value to open-web publishers and advertisers. [REDACTED]  
[REDACTED]  
[REDACTED]

#### **IV.B.1. Publisher perspectives on open-web display advertising**

- (106) Dr. Israel and Prof. Ghose focus on [REDACTED]  
[REDACTED]  
[REDACTED]

- (107) As I explained in Section III and IV.A.3 above and my initial report, focusing on advertiser substitution alone is not sufficient to demonstrate that a hypothetical monopolist could not exercise market power over a set of ad tech tools; it is necessary to also consider open-web publishers' (limited) ability to substitute away from such tools.

- (108) In my opening report, I explained that publishers that monetize their web inventory via open-web display advertising have limited ability to substitute away to other forms of advertising or monetization in response to an exercise of market power by a hypothetical monopolist of certain ad tech products. Google's experts do not address most of these limitations:

- Open-web publishers' ability to shift advertising sales away from their web content is limited by the content they provide. For example, digital content providers cannot monetize impressions on their web properties by selling offline advertising.<sup>158</sup> Similarly, in-app ads cannot monetize a publisher's web inventory.<sup>159</sup>
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

<sup>158</sup> Lee Initial Report, ¶¶ 268–270.

<sup>159</sup> Lee Initial Report, ¶ 275.

Expert Rebuttal Report of Robin S. Lee, PhD

- Instream video ads occupy different parts of a publishers' digital ad inventory (e.g., shown in a video player vs. shown in a "banner" ad at the top of the page).<sup>160</sup> Observed price differences are consistent with instream video and display ads not being close substitutes from a publisher's perspective—otherwise publishers would likely be expected to re-allocate their display advertising space to instream video to take advantage of the higher monetization rate.<sup>161</sup>
- Native ads are typically used in combination with display ads and occupy slots within, rather than above and around, publishers' content.<sup>162</sup>
- Adopting a new monetization strategy for open-web content (e.g., subscriptions) instead of relying at all on display advertising would be costly and forgo a valuable source of revenue.<sup>163</sup>
- For most open-web publishers, developing an integrated ad tech product would be costly and time consuming, require overcoming indirect network effects, and would limit access to advertiser demand.<sup>164</sup>

(109) [REDACTED]

---

<sup>160</sup> Lee Initial Report, ¶ 272.

<sup>161</sup> Lee Initial Report, ¶¶ 273–274.

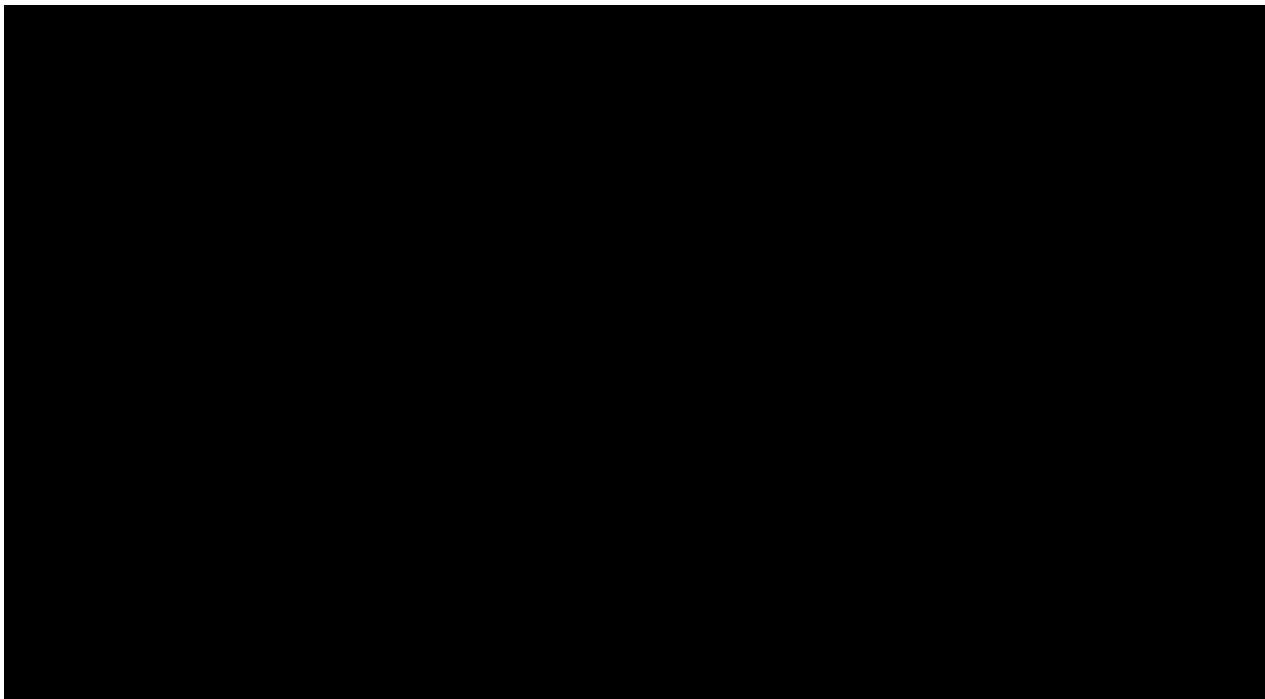
<sup>162</sup> Lee Initial Report, ¶ 276, noting also that there are quality issues (e.g., "clickbait ads") with certain forms of native ad that limit their use by publishers.

<sup>163</sup> Lee Initial Report, ¶ 266.

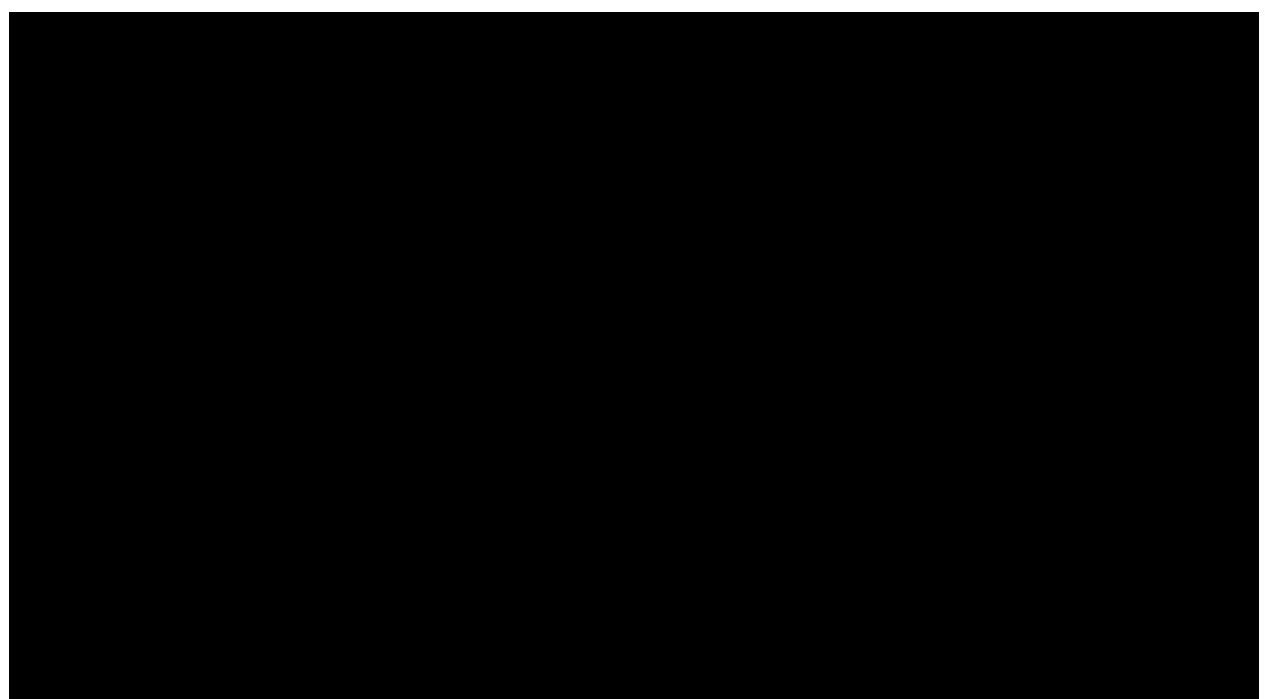
<sup>164</sup> Lee Initial Report, ¶ 281.

Expert Rebuttal Report of Robin S. Lee, PhD

**Figure 5.** Excerpt from [REDACTED]



**Figure 6.** Excerpt from [REDACTED]



Expert Rebuttal Report of Robin S. Lee, PhD

- (110) Dr. Israel's discussion of [REDACTED]  
[REDACTED]  
[REDACTED] I address Dr. Israel's [REDACTED]  
[REDACTED] in Section IV.C.1.
- (111) So while it is true that publishers may find it valuable to deploy multiple forms of digital advertising or transaction types within their "monetization toolbox,"<sup>168</sup> web display advertising has distinct features and value that make it an important form of advertising—i.e., it is an important tool in the toolbox. Hence, open-web publishers would be unlikely to substitute away to a sufficient degree from products that transact display advertising to constrain the exercise of market power by a hypothetical monopolist of publisher ad servers, ad exchanges, or advertiser ad networks.

#### **IV.B.2. Advertiser perspectives on open-web display advertising**

- (112) Dr. Israel asserts that [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] Prof. Ghose argues that [REDACTED]  
[REDACTED]  
[REDACTED]
- (113) I do not dispute that many advertisers use multiple forms of digital advertising, or that advertisers can substitute across channels on the margin. Nevertheless, as with a hammer and screwdriver, advertisers can use multiple forms of advertising to achieve different objectives even if those forms may be potential substitutes for certain tasks.
- (114) However, with regard to the arguments made here, Google's experts fail to apply the economic principles articulated by the HMT to determine whether a relevant product market is too narrow.
- (115) First, Dr. Israel and Prof. Ghose [REDACTED]  
[REDACTED]

---

<sup>168</sup> Lee Initial Report, § IV.A.2.  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

- [REDACTED]
- [REDACTED]
- (116) Second, they fail to establish that advertisers view alternative forms of advertising as sufficiently close substitutes so that they would shift enough of their spending to different advertising channels to constrain a hypothetical monopolist of a single ad tech component (publisher ad servers, ad exchanges, or advertiser ad networks) from exercising market power, *even if all ad tech fee increases were passed through to advertisers* (which is unlikely to be the case, given the limited ability of publishers to substitute away from open-web display advertising tools).
- (117) There is evidence to the contrary. [REDACTED],  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] If advertisers are unlikely to divert a significant amount of impressions in response to an increase on prices that are already at supracompetitive levels, it follows as a matter of economics that they would be even less likely to divert impressions in response to a price increase from competitive levels.
- (118) Additionally, direct evidence of Google's exercise of market power over its ad tech products is a strong indicator that customer substitution alone would be insufficient to constrain a hypothetical monopolist in each of the relevant markets from exercising its own market power.<sup>173</sup>
- (119) Prof. Ghose also points to numerous factors that [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]
- (120) I next turn to specific arguments and examples Dr. Israel and Prof. Ghose offer as to [REDACTED]  
[REDACTED]

---

<sup>171</sup> See Sections III and IV.A.3 above

[REDACTED]

<sup>173</sup> See Lee Initial Report, § V.

[REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

**IV.B.2.a. Advertiser allocation of marketing spend does not demonstrate that advertiser substitution is sufficient to constrain the exercise of market power in the relevant markets**

(121) Google's experts claim that I ignore [REDACTED]

[REDACTED] In purported support of this claim, Google's experts highlight select documents that [REDACTED]  
[REDACTED]  
[REDACTED]

(122) However, these documents and discussion do not support their claim.<sup>178</sup> The presented documents indicate that [REDACTED]

[REDACTED] For example:

- Dr. Israel points to [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

---

<sup>178</sup> I understand that Prof. Wilbur has also evaluated [REDACTED] *See Wilbur Report, § IV.*

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

**Figure 7. Excerpt from 2020 Census Evaluation Report: Investigating Digital Advertising and Online Self-Response****Table 6. Responses by Referral Source.**

Referral Source	Sufficient Response Count	Sufficient Response %
<b>Census Mailer</b>	<b>35,052,960</b>	<b>39.3%</b>
Mailer URL	34,879,002	39.1%
Mistyped Mailer URL	173,958	0.2%
<b>Digital Advertisement or Promotional Material</b>	<b>21,317,822</b>	<b>23.9%</b>
<b>Non-Social Display Advertisement</b>	<b>114,444</b>	<b>0.1%</b>
Non-Social Banner Advertisement	84,678	0.1%
Non-Social Video Advertisement	25,982	<0.1%
Unknown Non-Social Advertisement Format	3,784	<0.1%
<b>Social Media Display Advertisement</b>	<b>346,323</b>	<b>0.4%</b>
Social Media Banner Advertisement	219,356	0.2%
Social Media Video Advertisement	124,362	0.1%
Unknown Social Media Advertisement Format	2,605	<0.1%
Civic Engagement Activity	2,600,411	2.9%
Search Advertisement	18,256,144	20.5%
Other or Unclassified Ad	500	<0.1%
<b>Advertising Campaign URL</b>	<b>11,701,094</b>	<b>13.1%</b>
<b>Non-Advertisement Website</b>	<b>12,810,096</b>	<b>14.4%</b>
Non-Advertisement Search Results	10,595,739	11.9%
Non-Advertisement Social Media Post	410,573	0.5%
Other Non-Advertisement Website	1,803,784	2.0%
<b>Census Operation / Other Source</b>	<b>580,519</b>	<b>0.7%</b>
<b>Uninterpretable Referral Paradata</b>	<b>688,475</b>	<b>0.8%</b>
<b>No Referral Paradata</b>	<b>7,074,516</b>	<b>7.9%</b>
<b>Grand Total</b>	<b>89,225,482</b>	<b>100.0%</b>

Source: U.S. Census Bureau, 2020 Census, 2020 ISR Paradata and CURL

- Prof. Ghose cites [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]
- Dr. Israel claims [REDACTED]  
[REDACTED]

---

[REDACTED]  
[REDACTED]

## Expert Rebuttal Report of Robin S. Lee, PhD

- Prof. Ghose highlights a [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]
  - Prof. Ghose cites a document from [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]
  - Prof. Ghose also cites deposition testimony that [REDACTED]  
[REDACTED]  
[REDACTED]

Prof. Ghose and Dr. Israel also cite documents and [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

---

HIGHLY CONFIDENTIAL

## Expert Rebuttal Report of Robin S. Lee, PhD

A horizontal bar chart with ten bars of varying lengths. The bars are black with thin white outlines. They are arranged vertically from top to bottom. The first bar is the longest, followed by a short gap, then a medium-length bar, another short gap, and so on, creating a pattern of alternating short and long bars.

- (125) Google's experts also present analyses of advertiser spending demonstrating that advertisers such as

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

- (126) [REDACTED] Indeed, Prof.  
[REDACTED]  
Ghose identifies numerous factors that [REDACTED]

Term	Percentage
Global warming	98%
Green energy	95%
Sustainable development	92%
Clean water	90%
Renewable energy	88%
Carbon footprint	85%
Recycling	82%
Energy efficiency	78%
Green technology	75%
Organic food	72%
Green building	68%
Green products	65%
Green infrastructure	62%
Green economy	58%
Green jobs	55%
Green transportation	52%
Green architecture	48%
Green design	45%
Green materials	42%
Green engineering	38%
Green infrastructure	35%
Green construction	32%
Green planning	28%
Green zoning	25%
Green permitting	22%
Green procurement	18%
Green standards	15%
Green regulations	12%
Green ordinances	8%
Green codes	5%
Green policies	3%
Green laws	1%

Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED] any of which could explain the patterns in Google's experts' analyses.<sup>197</sup>

(127) I also understand that Prof. Wilbur has assessed [REDACTED]

[REDACTED]

(128) Last, Prof. Ghose argues that [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] Yet both terms simply refer to the notion that consumer purchasing decisions involve multiple stages at which the effectiveness of advertising will vary.<sup>201</sup> To the extent Prof. Ghose is suggesting that [REDACTED]

[REDACTED]

[REDACTED]

---

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

<sup>201</sup> See e.g., Lee Initial Report, n. 34, quoting from Philip Kotler and Kevin Lane Keller, *A Framework for Marketing Management*, 16<sup>th</sup> ed. (Pearson Education, 2016): 122 (“A consumer's purchase journey need not be linear, as a consumer may revisit stages or proceed in a different ordering prior to making a purchase. The effectiveness of different forms of advertising will still vary depending on an advertiser's objective and the consumer's awareness, interest, and desire”). I understand that Prof. Wilbur also concludes that these concepts are interchangeable and that Prof. Ghose's criticism of my analysis is misleading and incorrect. See Wilbur Report, § V

[REDACTED]  
[REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

**IV.B.2.b. Survey evidence relied on by Dr. Israel does not demonstrate [REDACTED]**

(129) In his report, Dr. Israel relies on [REDACTED]  
[REDACTED]  
[REDACTED]

(130) As I discussed above, taking Dr. Israel's representation of [REDACTED] [REDACTED]  
[REDACTED]

- [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]
- [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]
- [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

(131) Even setting these issues aside, Dr. Israel's discussion of [REDACTED]  
[REDACTED] This is for the following reasons.

(132) First, according to Dr. Israel, [REDACTED]  
[REDACTED]  
[REDACTED] [REDACTED]  
[REDACTED]  
[REDACTED]

- 
- [REDACTED]
  - [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]
  - [REDACTED]

## Expert Rebuttal Report of Robin S. Lee, PhD



**IV.B.2.c. The presence of [REDACTED] identified by Dr. Israel and Prof. Ghose does not demonstrate that**

Expert Rebuttal Report of Robin S. Lee, PhD

(138) Dr. Israel is incorrect in stating that [REDACTED]

[REDACTED] These product markets include certain ad tools (publishers ad servers, ad exchanges, and advertising ad networks) if they facilitate open-web display advertising—a distinct form of advertising that is valuable to advertisers and publishers. Tools are excluded if they *cannot* facilitate open-web display advertising, not because they also facilitate another form of advertising. As long as an ad tech product can facilitate open-web display transactions as a publisher ad server, an ad exchange, or an advertiser ad network, it is in one of the relevant product markets.

(139) As another example, consider Facebook Audience Network (FAN). [REDACTED]

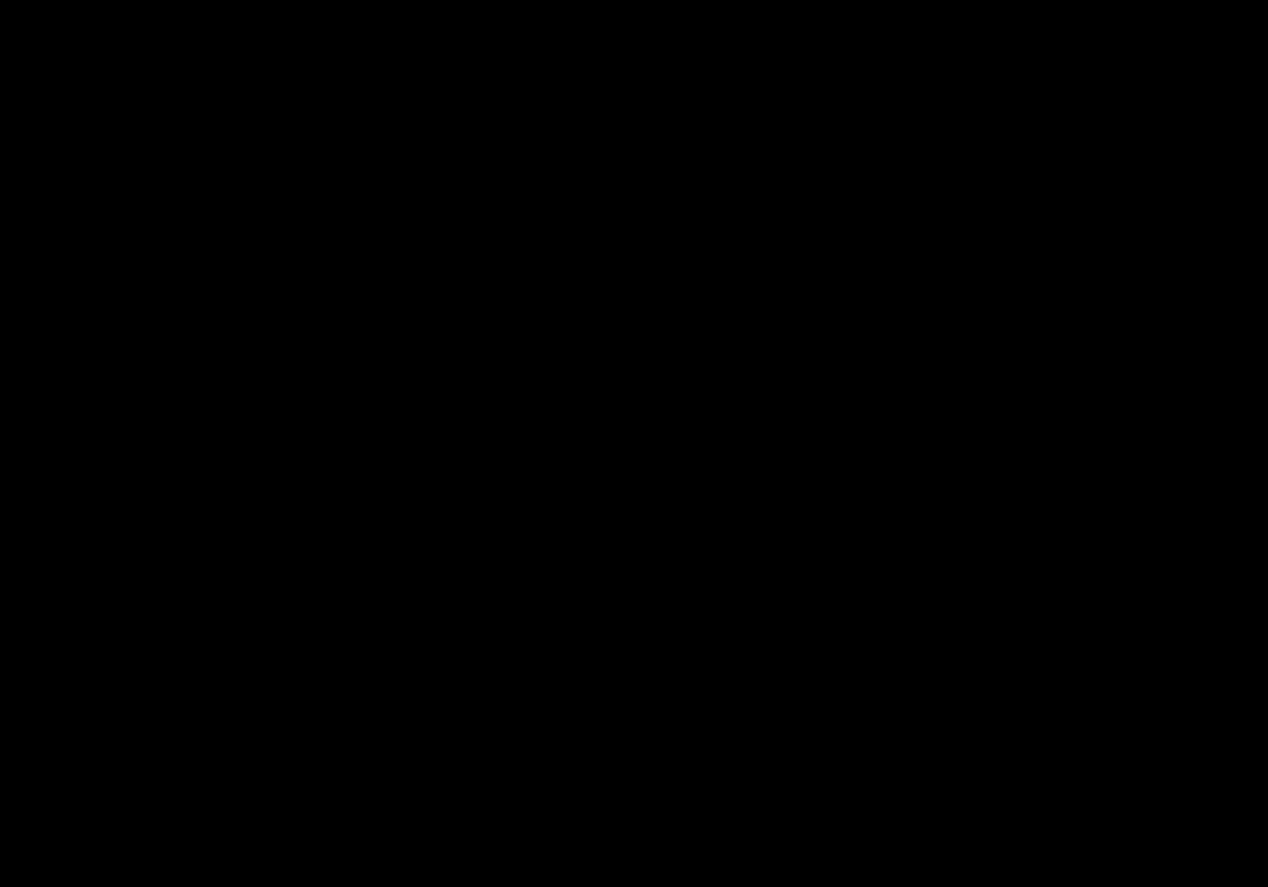
[REDACTED] But FAN is a product contained in the advertiser ad network market during the periods in which it was available to customers seeking to transact open-web display transactions; [REDACTED]

---

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

**Figure 8. Figure 56 from Lee Initial Report**



(140) Google's experts err by



As I note there and in my initial report,<sup>218</sup> for the purposes of computing market shares (which are used as indirect evidence of market power, *not as the basis for defining relevant markets*), I restrict attention to open-web display transactions so as to illuminate, not obscure, the extent to which Google possesses market power over different sets of ad tech products. However, this does not mean that ad tech products that *could also* be used to sell other forms of advertising are necessarily excluded as products from the relevant markets.

---

<sup>218</sup> Lee Initial Report, n. 576 (“Where possible, I exclude transactions that are sold through a publisher’s own integrated ad tech products from market share estimates. Limiting market share calculations to transactions fulfilled on ad inventory not owned and operated by an ad tech product more accurately reflects the competitive significance of a product’s ability to transact open-web display inventory.”).

## Expert Rebuttal Report of Robin S. Lee, PhD



<sup>224</sup> Additionally, as noted in my initial report, the label “relevant” serves to differentiate the analytic construct of a relevant market from other uses of the term “market”: *see* 2010 HMG, § 4 (“Relevant antitrust markets defined according to the hypothetical monopolist test are not always intuitive and may not align with how industry members use the term ‘market.’”); *See also* Jonathan B. Baker, “Market Definition: An Analytical Overview,” *Antitrust Law Journal* 74, no. 1 (2007), 130 (labeling markets as relevant or antitrust markets “distinguish[es] these markets from what business executives and consultants might define for other purposes.”). 2023 HMG § 4.3.D.3.

Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED]

- (145) In the remainder of this Section, I discuss [REDACTED] identified by Dr. Israel and Prof. Ghose and explain why their analyses of [REDACTED]

[REDACTED]  
IV.B.2.c.i. Advertising on properties using integrated advertising tools, including large social media properties

- (146) In my initial report I highlighted four reasons that from the perspective of advertisers, open-web display advertising is distinct from advertising on websites for publishers such as Amazon and Facebook that sell owned-and-operated display inventory using integrated tech products. [REDACTED]

[REDACTED]  
■ [REDACTED]  
[REDACTED]  
■ [REDACTED]  
[REDACTED]

Among other evidence, I highlighted a 2020 survey that consumers spend two-thirds of their time on properties not owned by major technology companies (such as Facebook, Instagram, and Amazon that use their own integrated ad tech).<sup>232</sup> Prof. Ghose argues that [REDACTED]

---

<sup>225</sup> Lee Initial Report, § IV.B.3; [REDACTED]

[REDACTED]  
■ [REDACTED]  
[REDACTED]  
■ [REDACTED]  
[REDACTED]  
■ [REDACTED]  
[REDACTED]  
■ [REDACTED]  
[REDACTED]  
■ [REDACTED]  
[REDACTED]

<sup>229</sup> Lee Initial Report, ¶ 290 (“Google recommends that advertisers use instream video ads ‘when you have video content you’d like to promote before, during, or after other videos’ while outstream ads are preferable for advertisers who ‘want to expand the reach of your video ads … helping you reach more customers.’”).

<sup>230</sup> Though market definition is based on demand-side substitution which is distinct “from what business executives and consultants might define for other purposes” (Jonathan B. Baker, “Market Definition: An Analytical Overview,” *Antitrust Law Journal* 74, no. 1 (2007), 130), Google’s product offerings and assessments can be informative as to how customers view the interchangeability of products.

■ [REDACTED]  
<sup>232</sup> Lee Initial Report, ¶ 300.

## Expert Rebuttal Report of Robin S. Lee, PhD

- “Open-web display advertising and advertising on applications or publishers with their own integrated ad tech tools can reach different groups of consumers, or reach similar groups of consumers at different times.”<sup>235</sup>

Consistent with this, many advertisers promote products using both types of ad inventory.<sup>236</sup>



<sup>236</sup> Lee Initial Report, ¶ 301.

Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED]

[REDACTED]

[REDACTED]

■ [REDACTED]

[REDACTED]

[REDACTED]

Prof. Ghose identifies [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

(147)

[REDACTED] I discuss next why these do not establish that  
advertisers view advertising on properties using integrated ad tech tools as sufficiently close

---

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

■ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

■ [REDACTED]

■ [REDACTED]

■ [REDACTED]

■ [REDACTED]

■ [REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

substitutes to constrain a hypothetical monopolist of a single ad tech component (publisher ad servers, ad exchanges, or advertiser ad networks) from exercising market power over advertisers and open-web publishers.

(148) **Documents.** [REDACTED]

[REDACTED] That Google documents discuss other firms as competitors does not speak to their substitutability from the perspective of customers. Though it may be common for firms to look at different levels of competition or look at their business in both broad and narrow groupings of competing products, that does not make those groupings antitrust markets.<sup>249</sup>

(149) [REDACTED]. [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

(150) Similarly, Dr. Israel quotes from a [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

---

<sup>249</sup> Jonathan B. Baker, “Market Definition: An Analytical Overview,” *Antitrust Law Journal* 74, no. 1 (2007), 130 (labeling markets as relevant or antitrust markets “distinguish[es] these markets from what business executives and consultants might define for other purposes.”).

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

## Expert Rebuttal Report of Robin S. Lee, PhD

Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED]. The same user may respond differently to an ad they view when scrolling through a Facebook feed as compared to a banner ad they view on a website, as I explain in my initial report.<sup>260</sup> [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

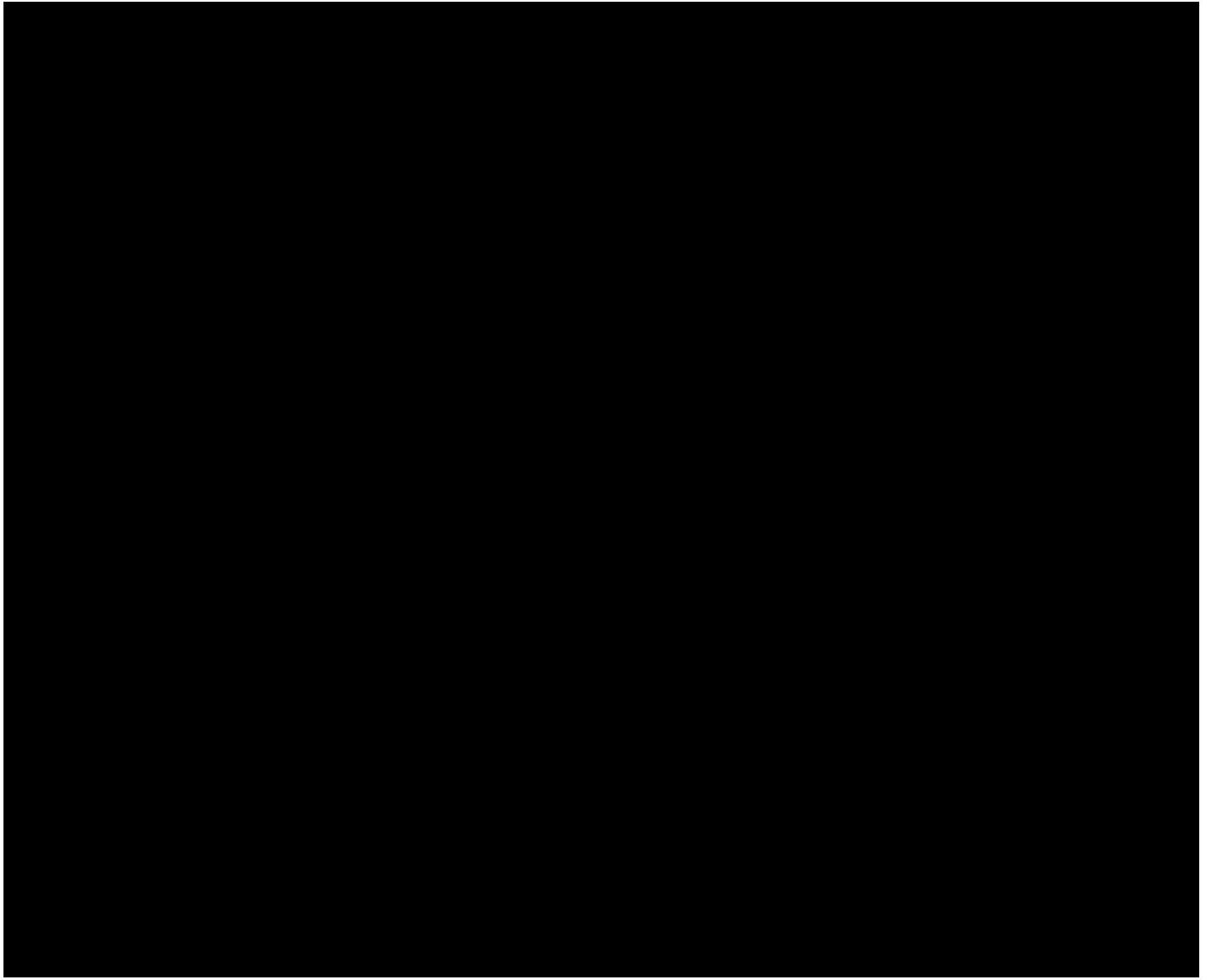
(155) [REDACTED]

[REDACTED] This is important because an integrated tool restricts an advertiser to visitors of that site. In contrast, open-web display provides access to a larger portion of online inventory *in combination*. For example, if a CNN user's second choice news site is split between The New York Times, The Washington Post, CBS News, and Fox News, a single open-web display tool could potentially allow an advertiser to reach all of those users. [REDACTED]  
[REDACTED]  
[REDACTED]

---

<sup>260</sup> Lee Initial Report, §§ II.A.2, II.A.3, IV.B.2.

**Figure 9.** [REDACTED]



(156) **Multihoming.** [REDACTED]

[REDACTED] Rather, the fact that advertisers purchase both types of inventory, in combination with the evidence I described above and in my opening report, is consistent with advertisers viewing both types of ad inventory as achieving different or complementary

Expert Rebuttal Report of Robin S. Lee, PhD

objectives.<sup>262</sup> [REDACTED]

#### IV.B.2.c.ii. In-app advertising

- (157) In my initial report I explained that “from the perspective of advertisers, [open-web] advertising is distinct from advertising on applications.”<sup>264</sup> This is for several reasons, including some of the reasons discussed above for integrated properties: “open-web display advertising and advertising on applications...can reach different groups of consumers, or reach similar groups of consumers at different times,”<sup>265</sup> and [REDACTED]  
[REDACTED] I also noted that “in-app advertisements may be seen primarily by smartphone users, who have different characteristics than web users that are reached by web-display advertising.”<sup>267</sup> [REDACTED]

- (158) Rather, Dr. Israel points to the fact that [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]

- (159) Dr. Israel’s finding that [REDACTED]

[REDACTED] Such growth is consistent with advertising patterns following consumer app usage. However, Dr. Israel’s inference that [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

---

<sup>264</sup> Lee Initial Report, ¶ 299.

<sup>265</sup> Lee Initial Report, ¶ 301.

<sup>267</sup> Lee Initial Report, ¶ 301.

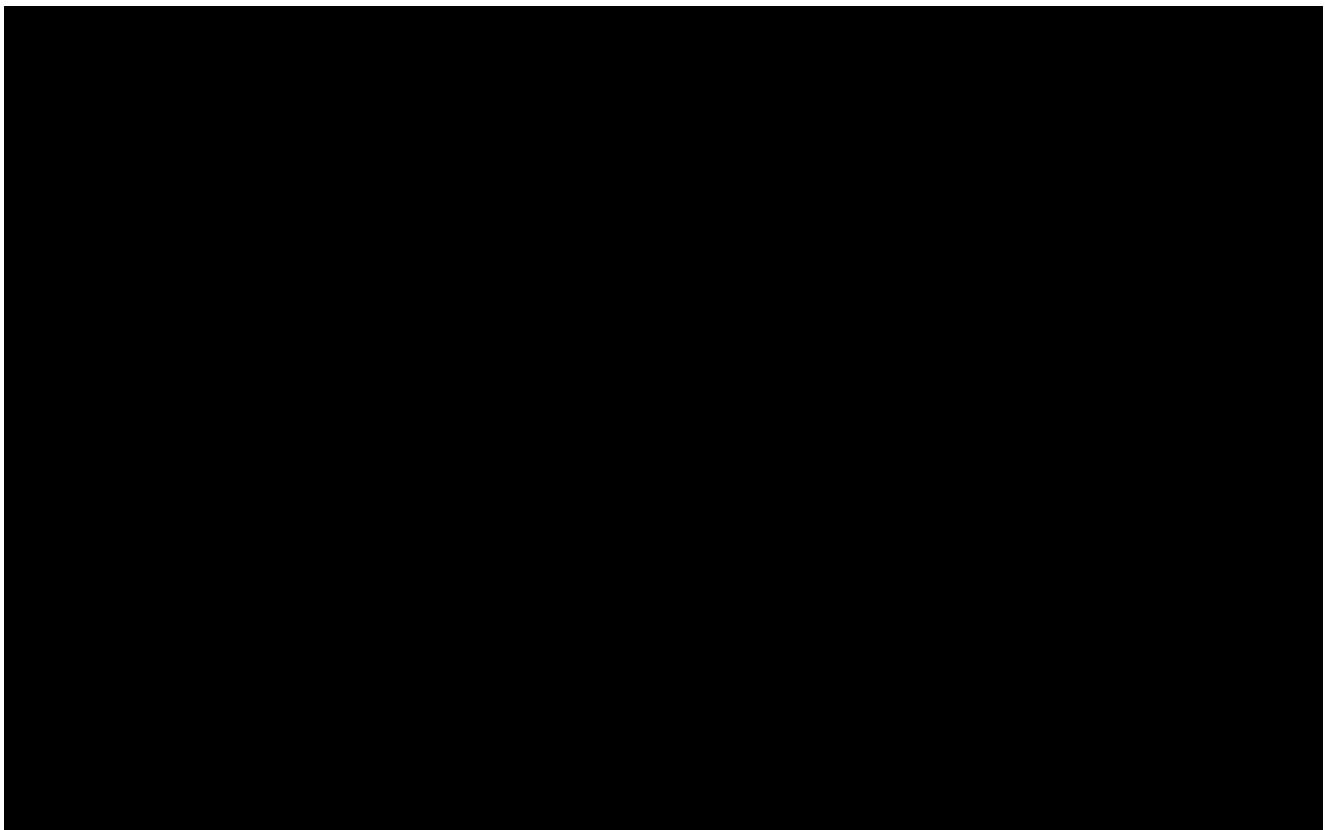
<sup>268</sup> [REDACTED]

<sup>269</sup> [REDACTED]

<sup>270</sup> [REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

**Figure 10.** [REDACTED]



(160) Dr. Israel also points to [REDACTED]  
[REDACTED]  
[REDACTED] Rather, taken at face value, they imply that [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

---

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

IV.B.2.c.iii. Instream video advertising

- (161) In my initial report, I explained that:<sup>274</sup>

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
Google recommends that advertisers use instream video ads “when you have video content you’d like to promote before, during, or after other videos” while outstream ads are preferable for advertisers who “want to expand the reach of your video ads ... helping you reach more customers.”

Instream video advertising also serves a distinct purpose for advertisers relative to web display ads. [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]

- (162) In response, Dr. Israel claims that [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED] However, his analyses fail to support his opinion that the relevant markets [REDACTED]

- (163) First, Dr. Israel’s analysis that [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

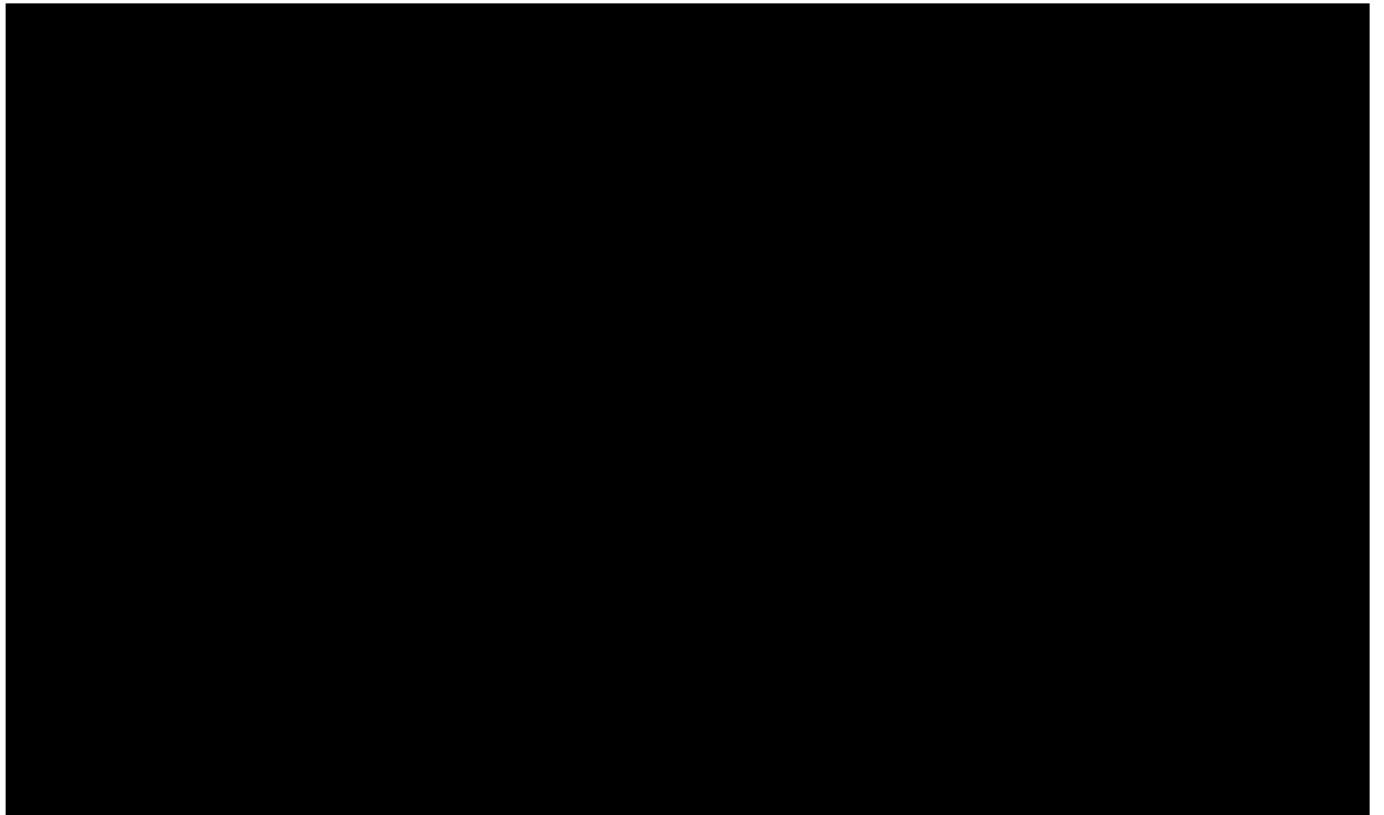
---

<sup>274</sup> Lee Initial Report, ¶¶ 290–291.

[REDACTED]

[REDACTED]

**Figure 11.** [REDACTED]



(164) [REDACTED]  
[REDACTED]  
[REDACTED]. As noted above in IV.A.4, multihoming is not  
the same as substitution. However, Dr. Israel's analysis also demonstrates that [REDACTED]  
[REDACTED]  
[REDACTED] Such spending patterns do not necessarily indicate that  
advertisers would substitute away from open-web display to instream-video only in response to a  
price increase in *ad tech tools* (and not display advertising).

(165) Last, Dr. Israel again points to [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

---

[REDACTED]  
[REDACTED]  
[REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED]

#### IV.B.2.c.iv. Native advertising

- (166) In my initial report I explained that:<sup>282</sup>

Native advertising is also distinct from web display advertising from an advertiser's perspective. Whereas traditional banner display ads are distinguishable from a publisher's content, native ads are styled to blend into the format of a publisher's site.

[REDACTED]

- (167) I further described "three prominent forms of native ads: sponsored listing, social, and content recommendation" and explained that "each form is distinct from display advertising from an advertiser's perspective."<sup>283</sup>

- "*Sponsored Product or Sponsored Listing*"

284

285

- "*Social media* (or 'in-feed social') ads appear in social media feeds and closely resemble organic posts on those sites."<sup>286</sup>

[REDACTED] For example, one Google executive [REDACTED]—its "product for ads placed on

[REDACTED]

<sup>282</sup> Lee Initial Report, ¶ 294.

<sup>283</sup> Lee Initial Report, ¶ 294.

<sup>284</sup> Lee Initial Report, ¶ 49.

<sup>285</sup> Lee Initial Report, ¶ 294.

<sup>286</sup> Lee Initial Report, ¶ 49 (emphasis added).

<sup>287</sup> Lee Initial Report, ¶¶ 294–296.

Expert Rebuttal Report of Robin S. Lee, PhD

Google's 'O&O feed-like properties'—“[REDACTED]

[REDACTED] 288

- “Content recommendation ads are collections of links that suggest additional external content for users.”<sup>289</sup> They “are considered by many industry participants to contain lower quality content than display ads” and “website operators tend to place these ad units at the bottom of their pages or prefer to not use them at all.”<sup>290</sup> [REDACTED]

[REDACTED] 291

(168) [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

(169) [REDACTED]

[REDACTED]  
[REDACTED] Instead,  
Dr. Israel asserts that [REDACTED]  
[REDACTED]  
[REDACTED] Dr. Israel does not identify any specific arguments to which he is  
referring, [REDACTED]  
[REDACTED]

#### **IV.B.3. Indirect transactions for open-web display advertising provide additional distinct value to publishers and advertisers**

- (170) As I discussed in my initial report, there are important distinctions between indirect and direct transactions for open-web display advertising from the perspective of publisher and advertisers.<sup>295</sup>

288 [REDACTED]

289 Lee Initial Report, ¶ 49.

290 Lee Initial Report, ¶ 49.

291 [REDACTED].

[REDACTED]

[REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]

295 Lee Initial Report, Section IV.B.4.

Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED]  
[REDACTED] Indirect transactions also provide advertisers with additional supply of ad slots and allow advertisers to adjust their bids for ad inventory in real-time to “buy the ad space they value the most.”<sup>298</sup> [REDACTED]

(171) [REDACTED]  
[REDACTED]

[REDACTED] are consistent with direct and indirect channels not being close substitutes from a publisher’s perspective, since otherwise publishers would have a clear incentive to switch inventory from indirect to direct sales channels. [REDACTED]

(172) [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

---

<sup>296</sup> See Lee Initial Report, Section IV.B.4. [REDACTED]

<sup>297</sup> Lee Initial Report, ¶¶ 309–311; [REDACTED]

<sup>298</sup> Neal Mohan, “A year of the new DoubleClick Ad Exchange: improving large publishers’ returns,” Google Official Blog, (blog), January 16, 2011, <https://googleblog.blogspot.com/2011/01/year-of-new-doubleclick-ad-exchange.html>.

[REDACTED]  
[REDACTED]

## Expert Rebuttal Report of Robin S. Lee, PhD

## Expert Rebuttal Report of Robin S. Lee, PhD

#### **IV.B.3.a. Advertiser and publisher use of both direct and indirect sales channels**

- (176) With respect to the first point, as I explained above in Section IV.A.3, simply using two different sales channels does not equate to close substitution between them.

A solid black horizontal bar used for redacting sensitive information.

- (177) [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

(178) Dr. Israel argues in response that [REDACTED]

- (178) Dr. Israel argues in response that [REDACTED]  
[REDACTED]  
[REDACTED] [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

[REDACTED]

- A horizontal bar chart with 10 categories on the x-axis and 180 items on the y-axis. The bars are black. Category 1 has a value of 180. Category 2 has a value of 180. Category 3 has a value of 20. Category 4 has a value of 180. Category 5 has a value of 180. Category 6 has a value of 180. Category 7 has a value of 180. Category 8 has a value of 180. Category 9 has a value of 180. Category 10 has a value of 180.

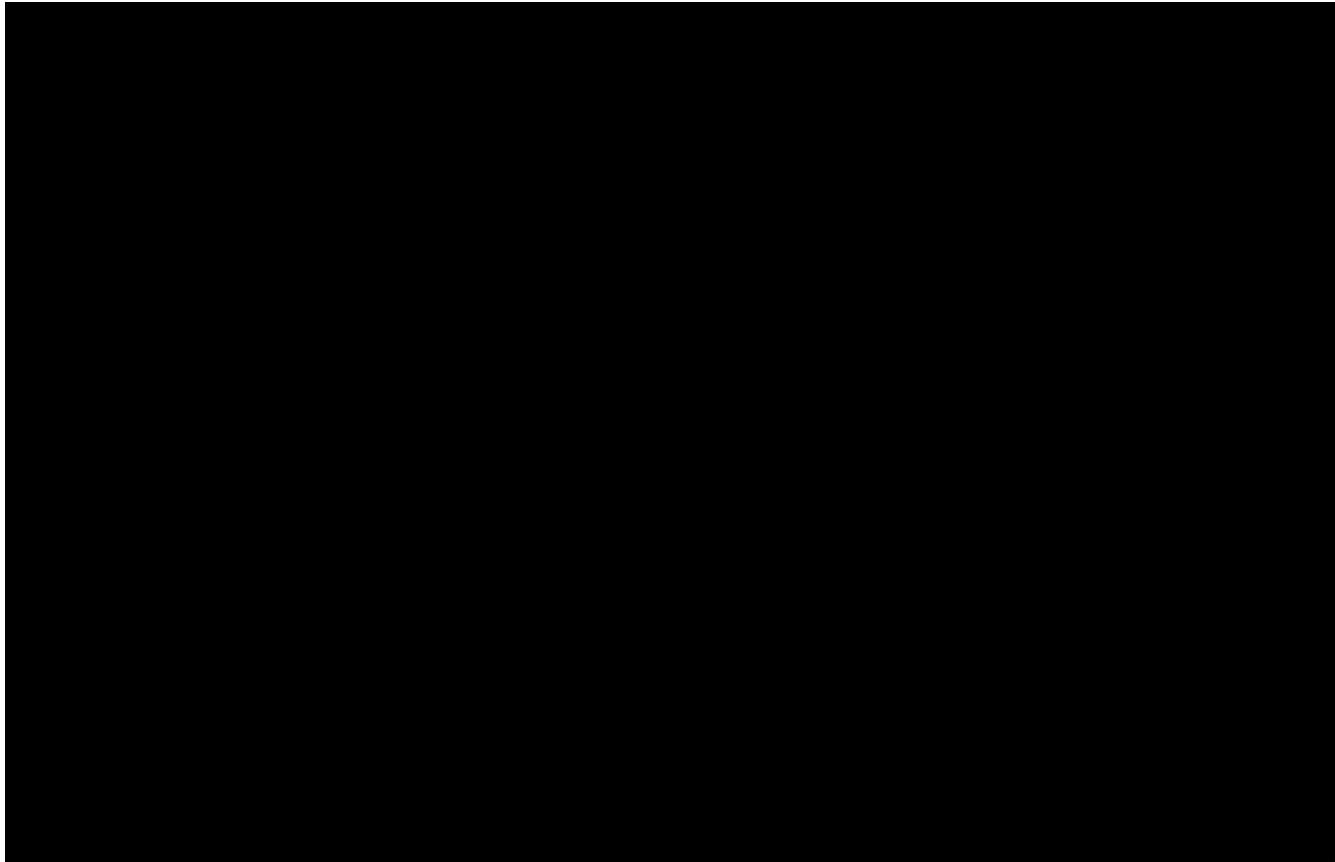
Category	Value
1	180
2	180
3	20
4	180
5	180
6	180
7	180
8	180
9	180
10	180

Expert Rebuttal Report of Robin S. Lee, PhD



Figure 12. [REDACTED]

[REDACTED]



**IV.B.3.b. Evidence of advertiser and publisher substitution between direct and indirect channels**

(181) Dr. Israel argues that [REDACTED]



## Expert Rebuttal Report of Robin S. Lee, PhD

- (182) As additional evidence of advertiser and publisher substitution between direct and indirect deals, [REDACTED]  
[REDACTED]

(183) Finally, even if one were to ignore the clear evidence that indirect transactions provide distinct value to advertisers and publishers and direct transactions are not close enough substitutes to discipline an exercise of market power, the inclusion of programmatic direct transactions does not meaningfully

Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED]

[REDACTED]

## IV.C. Publisher ad servers is a relevant product market

- (184) In my initial report, I discussed why publisher ad servers that can be used to serve or transact open-web display advertising (henceforth, “publisher ad servers”) are a relevant antitrust product market and useful for analyzing Google’s scrutinized conduct.<sup>320</sup>
- (185) Publisher ad servers are software products that can be used to manage and sell both direct and indirect display advertising across web properties. [REDACTED]  
[REDACTED]  
[REDACTED] Publisher ad servers are particularly important for publishers with more complex display advertising needs, including those seeking to meet the pricing and scheduling requirements of direct deals while also allocating inventory via RTB.<sup>322</sup>
- (186) Moreover, a firm possessing substantial and sustained market power over publisher ad servers, protected by significant barriers to entry, would be able to engage in conduct harming competition among publisher ad servers as well as among other ad tech products, including ad exchanges. [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]
- (187) [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

---

<sup>320</sup> Lee Initial Report, § IV.C.

<sup>322</sup> Lee Initial Report, ¶ 316.

[REDACTED]  
[REDACTED]  
[REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED]

[REDACTED]

- (188) [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

**IV.C.1.** [REDACTED]

[REDACTED]

- (189) [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

- (190) First and foremost, the presence of potential substitutes for some customers outside of the relevant market does not necessarily invalidate that market. The relevant criterion for whether potential alternatives are close enough substitutes to warrant inclusion is whether they would impose a sufficient competitive discipline to prevent a hypothetical monopolist of publisher ad servers for open-web display advertising from exercising market power over competitive levels (see Section IV.A.1 above).

- (191) [REDACTED]  
[REDACTED]  
[REDACTED]

[REDACTED] Direct evidence includes Google's own internal analyses indicating publishers' limited ability to substitute away from DFP in the event of a price increase.<sup>329</sup>

- (192) [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

---

<sup>329</sup> Lee Initial Report, ¶ 458.

## Expert Rebuttal Report of Robin S. Lee, PhD

(193)

#### **IV.C.1.a. Web publishers shifting content or users to mobile applications is not sufficient to defeat an exercise of market power by a hypothetical monopolist of publisher ad servers**

(194) In my initial report, I noted that a web publisher's options for using advertising is limited by the nature of the content that it offers.<sup>333</sup> In particular, even if a web publisher has a mobile application, it is not the case that the publisher could use in-app display ads to monetize its web inventory—a given display impression is either web or in-app.

(195) [REDACTED] Setting aside substantial direct evidence that DFP has and is already exercising significant market power despite these options (thereby supporting a publisher ad server market that contains DFP), [REDACTED]

(196) [REDACTED] A product is contained in the publisher ad server market if it can serve open-web display ads; products,

<sup>333</sup> Lee Initial Report, § IV.B.1.a.

## Expert Rebuttal Report of Robin S. Lee, PhD

(229) [REDACTED]

#### **IV.D.1.** [REDACTED]

**ANSWER** **QUESTION**

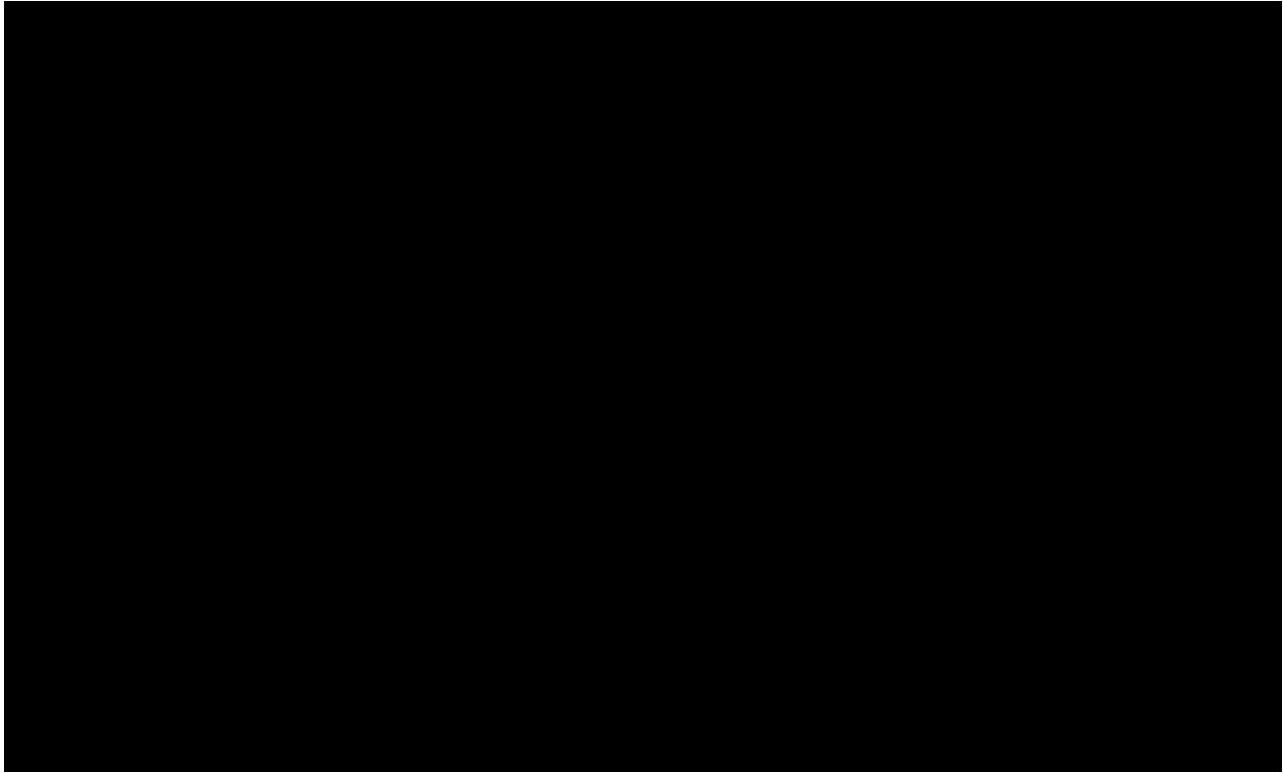
(230) [REDACTED]

(231) As I noted above in the case of the publisher ad server market, the presence of potential substitutes for some customers outside of a relevant market does not necessarily invalidate that market. In this case, the relevant criterion for whether potential alternatives are close enough substitutes to warrant inclusion is whether they would impose a sufficient competitive discipline to prevent a hypothetical monopolist of ad exchanges for open-web display advertising from exercising market power over competitive levels.<sup>379</sup>

<sup>379</sup> See discussion in Section IV A 1 above.

Expert Rebuttal Report of Robin S. Lee, PhD

**Figure 13.** [REDACTED]



(245) [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED] [REDACTED]  
[REDACTED] In addition, these market shares are also  
unlikely to be representative of AdX's market share in the ad exchange market for other reasons:

- [REDACTED]  
■ [REDACTED]  
■ [REDACTED]
  

---

- [REDACTED]  
■ [REDACTED]  
■ [REDACTED]  
■ [REDACTED]  
■ [REDACTED]  
■ [REDACTED]

## Expert Rebuttal Report of Robin S. Lee, PhD

(249)

Term	Percentage
GMOs	~95%
Organic	~90%
Natural	~85%
Artificial	~75%
Organic	~95%
Natural	~90%
Artificial	~75%
Organic	~95%
Natural	~90%
Artificial	~75%

(250)

[REDACTED]

[REDACTED]

[REDACTED]

Hence, these shares are also not informative for an assessment of Google's market power.

#### **IV.E. Advertiser ad networks is a relevant product market**

(251) In my initial report, I discussed why advertiser ad networks that can be used to transact open-web display advertising (henceforth “advertiser ad networks”) is an appropriate relevant antitrust market for analyzing the conduct at issue in this matter.<sup>408</sup> [REDACTED]

In addition, a variety of evidence demonstrates that Google Ads can exercise substantial market power, which supports the notion that it is not constrained by competitors outside of the advertiser ad network market.<sup>410</sup>

<sup>408</sup> Lee Initial Report, § IV.E.

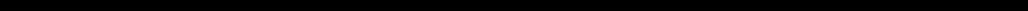
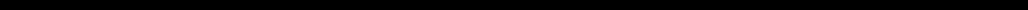
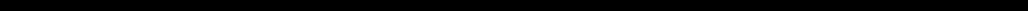
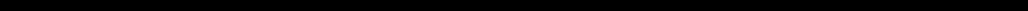
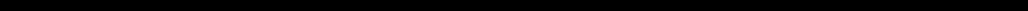
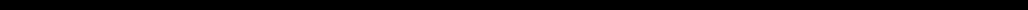
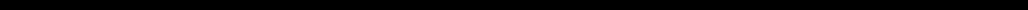
---

<sup>410</sup> Lee Initial Report, § V.D.3.

## Expert Rebuttal Report of Robin S. Lee, PhD

constrain the market power of a hypothetical monopolist over ad exchanges.

[REDACTED]

(338)	
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	
	

#### **IV.E.5.**

[REDACTED]

[REDACTED]

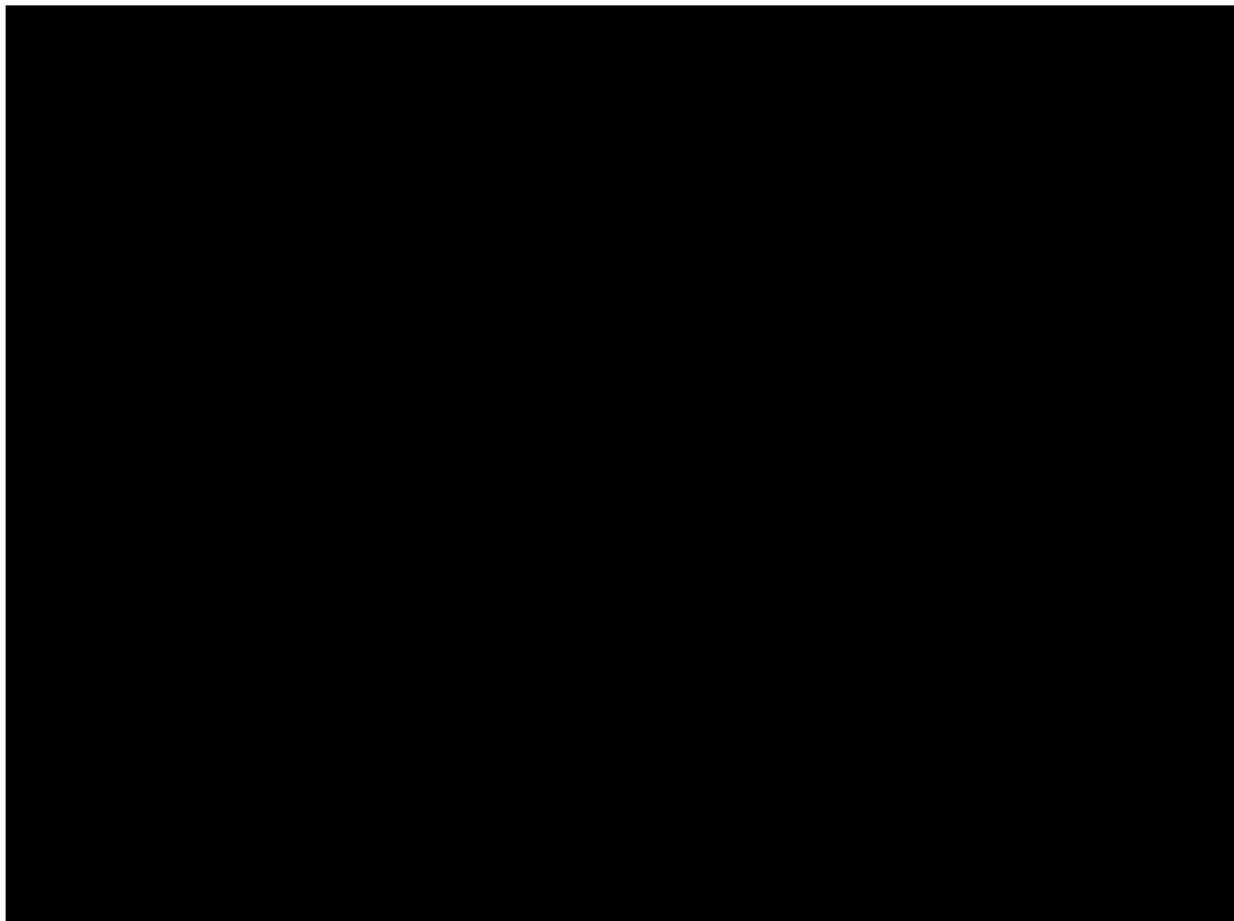
[REDACTED]

(339) [REDACTED]

(340) [REDACTED]

## Expert Rebuttal Report of Robin S. Lee, PhD

**Figure 20.**



(341)

A series of horizontal black bars of varying lengths, starting from a short bar at the bottom and increasing in length towards the top. The bars are evenly spaced vertically.

---

© 2010 Pearson Education, Inc., publishing as Pearson Addison Wesley.

Expert Rebuttal Report of Robin S. Lee, PhD

**Figure 21.** [REDACTED]



#### **IV.F. Relevant geographic markets for publisher ad servers, ad exchanges, and advertiser ad networks**

- (342) In my initial report, I described why the United States is a relevant geographic market for all three relevant product markets.<sup>530</sup>

---

<sup>530</sup> Lee Initial Report, § IV.F.2. There, I noted that a hypothetical monopolist of each relevant product market would likely be able to profitably exercise market power over all advertiser and open-web publisher customers within the United States without being constrained by pricing for customers located outside of the United States. Moreover, the competitive effects of Google's conduct are likely to be particularly meaningful within the US: a meaningful share of Google's revenues and those from other parties from open-web display advertising originate from customers within the US.

Expert Rebuttal Report of Robin S. Lee, PhD

- (343) I also discussed why the entire world, excluding a limited number of regions (henceforth, “worldwide”) is a relevant geographic market for all three relevant product markets.<sup>531</sup> I provided three reasons why worldwide is an appropriate geographic market for evaluating Google’s market power in the relevant product markets and the competitive effects of its conduct:
- 1. Customers of all three relevant product markets (advertisers and open-web publishers) are located worldwide, and transact across country and region boundaries.
  - 2. “Supply-side” competition among ad tech providers is global: the major competitors in each relevant product market serve customers across multiple countries, and scale effects are not contained within country-specific boundaries. For example, an ad tech product with greater publisher inventory across different countries likely is better able to offer advertisers the ability to target and access users that visit those publishers than one confined to a single country.
  - 3. Google’s conduct that I evaluate in this report is not limited to the boundaries of any one country. Google has imposed restrictions on the use of its Google Ads, ADX, and DFP products by open-web publishers and advertisers located worldwide. Hence, the competitive effects of Google’s conduct extend beyond any individual country’s borders.
- (344) Even though both worldwide and the United States fulfill the criteria for being relevant geographic markets, as I noted in my initial report,<sup>532</sup>
- (345) The ad tech industry and scope of Google’s conduct is [] global. Although there may be some differences in competitive conditions within narrower geographic regions, there are compelling benefits to examining the whole world when examining the competitive significance and effects of Google’s conduct within the relevant product markets.
- (346) Hence, to obtain a complete picture of the scope and impact of Google’s conduct, it is important to consider its market power and outcomes outside the boundaries of a single country.

#### IV.F.1. [REDACTED]

[REDACTED]

(347) [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

---

<sup>531</sup> Lee Initial Report, § IV.F.1. Moreover, I describe why the exclusion of a small number of regions where Google has limited presence or is restricted from operating in due to US sanctions does not prevent a hypothetical monopolist from profitably exercising market power.

<sup>532</sup> Lee Initial Report, ¶ 389.

[REDACTED]

Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

(348) [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

(349) Moreover, geographic markets are generally defined based on the location of suppliers or the location of customers.<sup>536</sup> I argued that a market based on the location of customers – that is, the advertisers and publishers that purchase the ad tech tools at issue – is appropriate for analyzing the conduct in this matter.<sup>537</sup> One difficulty that presents itself in calculating shares in a US market is that the location of advertisers and publishers is not always clear from the data.<sup>538</sup> In these cases, I used ad impressions served to US viewers as way to examine an ad tech product’s attractiveness to customers located in the US.<sup>539</sup> [REDACTED]

[REDACTED]

[REDACTED]

(350) [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

---

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

<sup>536</sup> Lee Initial Report, ¶ 387.

<sup>537</sup> Lee Initial Report, ¶ 387 (“A relevant geographic market can be based on the locations of customers (buyers or sellers of open-web display advertising). In this report, I focus on geographic market definition based on customer location—i.e., where open-web publishers and advertisers are located—and do not place restrictions on the location of suppliers.”).

<sup>538</sup> Lee Initial Report, ¶ 486 (“Due to data limitations, I am unable to compute reliable ad exchange market shares based on transactions restricted to ad exchange customer locations—i.e., based on transactions involving US open-web publishers or US advertisers. However, I am able to present market shares based on *user locations*—i.e., based on the location of the visitor to a publisher’s website.”).

<sup>539</sup> Lee Initial Report, ¶¶ 486–489.

[REDACTED]

[REDACTED]

[REDACTED]

## Expert Rebuttal Report of Robin S. Lee, PhD

The competitive strength in the United States of a firm with a 30% US share but *de minimis* worldwide share would be very different than a firm with a 30% US share and 40% of the worldwide share.

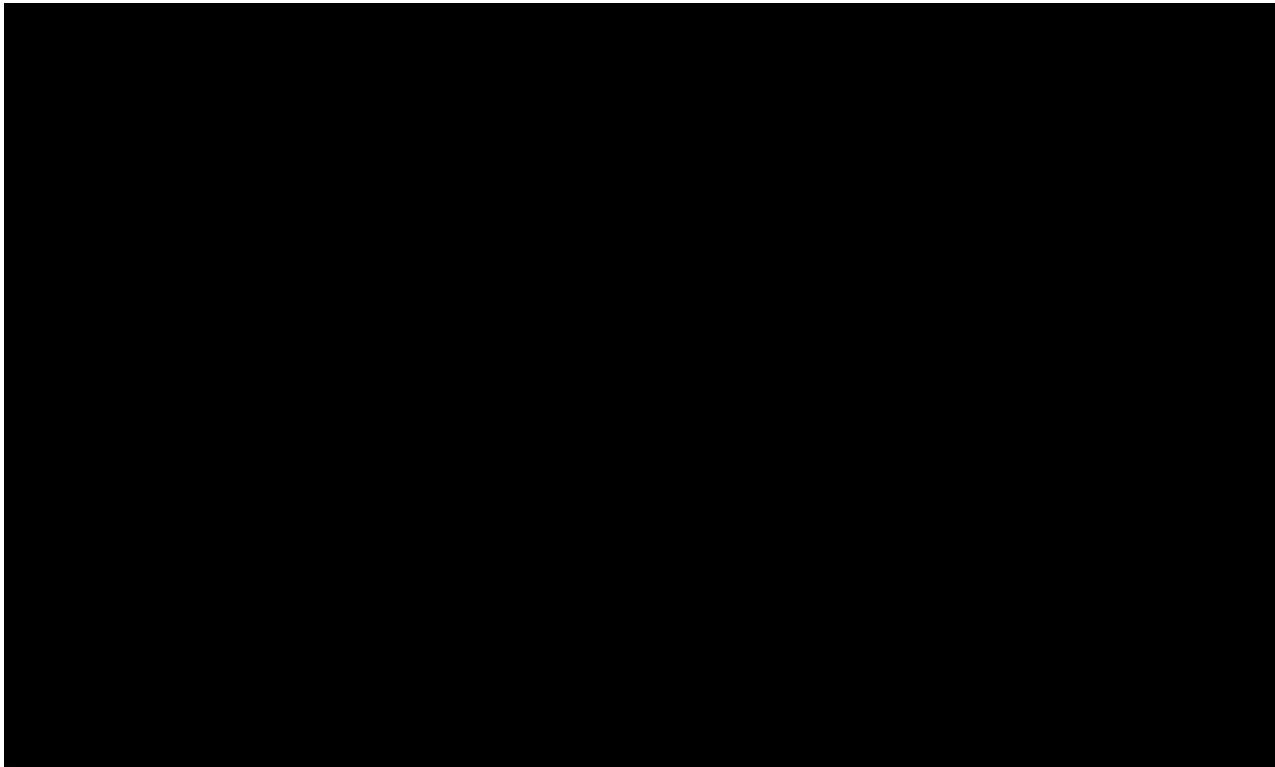
- (351) Additionally, the main participants in the three relevant product markets operate worldwide, not just in the United States. Customers on both sides of the market, advertisers and publishers, operate across national boundaries.<sup>542</sup>

[REDACTED] These 10 exchanges represented about 90% of indirect open-web display spending on DV360 across each of these five countries. AdX had the highest share of spending on DV360 by a large margin across all five countries, representing between 48% and 56% of spending.

<sup>542</sup> Lee Initial Report, ¶ 5 and Figure 40.

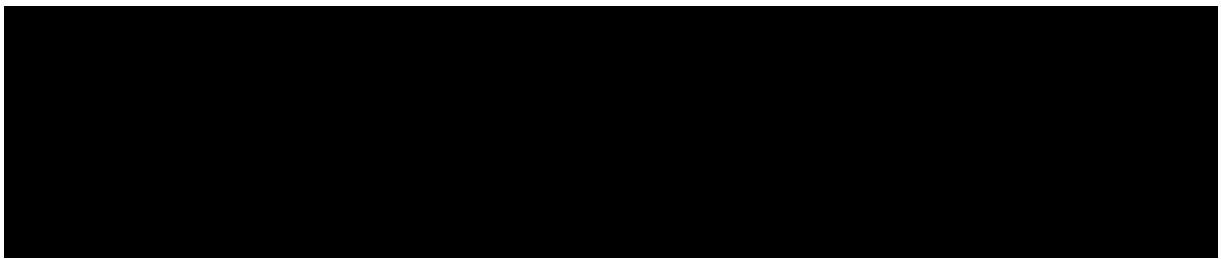
Expert Rebuttal Report of Robin S. Lee, PhD

**Figure 22.** [REDACTED]



(353) [REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

**Figure 23.** [REDACTED]



(354) Indeed, it is often the case that there is some variation in competitive conditions across countries or smaller regions impacted by a firm's scrutinized conduct. Yet when the conduct at issue spans regions, and when competition in regions is connected through economies of scale and scope or through customers that operate across regions, evaluating market power across regions or globally

Expert Rebuttal Report of Robin S. Lee, PhD

can lead to a better understanding of the overall competitive effects of that conduct. In this matter, for the relevant product markets at issue, all of these conditions hold. US customers are impacted not just directly by Google's conduct in the United States but also indirectly by Google's conduct worldwide, which impacts the competitive options available to US customers through the channels described above.

- (355) An example of this approach can be seen in the US government's 1998 case against Microsoft. In that case, the government alleged that Microsoft had engaged in anticompetitive conduct to protect its worldwide operating system monopoly, using a series of exclusionary contracts with computer OEMs and Internet service providers (ISPs) to stifle competition.<sup>544</sup> Though the details of the contracts, the legal and regulatory regime, and the competitive landscape likely varied across countries, the Plaintiffs argued that these contracts were all part of a strategy to limit competition in a worldwide geographic market.<sup>545</sup> The Court accepted a worldwide relevant geographic market.<sup>546</sup>

#### **IV.F.2. My conclusions do not change whether the product markets are analyzed on a worldwide or US**

- (356) None of my conclusions change whether the relevant product markets are found to be worldwide or US markets. The challenged conduct is the same within both geographies, and the sources of Google's market power are essentially the same within both geographies. Though there are some differences in market shares depending on the geographic region and the data used, these differences

---

<sup>544</sup> Complaint, *U.S. v. Microsoft Corp.*, Civil Action No. 98-1232 (D.D.C. May 18, 1998), ¶ 5, <https://www.justice.gov/atr/complaint-us-v-microsoft-corp>. (“To protect its valuable Windows monopoly against such potential competitive threats, and to extend its operating system monopoly into other software markets, Microsoft has engaged in a series of anticompetitive activities. Microsoft's conduct includes agreements tying other Microsoft software products to Microsoft's Windows operating system; exclusionary agreements precluding companies from distributing, promoting, buying, or using products of Microsoft's software competitors or potential competitors; and exclusionary agreements restricting the right of companies to provide services or resources to Microsoft's software competitors or potential competitors.”).

<sup>545</sup> Complaint, *U.S. v. Microsoft Corp.*, Civil Action No. 98-1232 (D.D.C. May 18, 1998), ¶ 54 (“the geographic market for PC operating systems is worldwide.”). See also, *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999), ¶18 (“Currently there are no products, nor are there likely to be any in the near future, that a significant percentage of consumers world-wide could substitute for Intel-compatible PC operating systems without incurring substantial costs. Furthermore, no firm that does not currently market Intel-compatible PC operating systems could start doing so in a way that would, within a reasonably short period of time, present a significant percentage of consumers with a viable alternative to existing Intel-compatible PC operating systems. It follows that, if one firm controlled the licensing of all Intel-compatible PC operating systems world-wide, it could set the price of a license substantially above that which would be charged in a competitive market and leave the price there for a significant period of time without losing so many customers as to make the action unprofitable. Therefore, in determining the level of Microsoft's market power, the relevant market is the licensing of all Intel-compatible PC operating systems world-wide.”).

<sup>546</sup> *United States v. Microsoft Corp.*, 84 F. Supp. 2d 9 (D.D.C. 1999), ¶ 18 (“Therefore, in determining the level of Microsoft's market power, the relevant market is the licensing of all Intel-compatible PC operating systems world-wide.”). See also, *United States v. Microsoft Corp.*, 253 F.3d 34 (D.C. Cir. 2001) (Noting that “[i]n this case, the District Court defined the market as ‘the licensing of all Intel-compatible PC operating systems worldwide,’ finding that there are ‘currently no products--and ... there are not likely to be any in the near future--that a significant percentage of computer users worldwide could substitute for [these operating systems] without incurring substantial costs.’” and subsequently, that “[a] remand on market definition is unnecessary...”).

## Expert Rebuttal Report of Robin S. Lee, PhD

(456) [REDACTED] In this section and in Section V.D.2, [REDACTED]  
[REDACTED]

## V.C.2.a. [REDACTED]

(457) [REDACTED]

(458) [REDACTED]

(459) [REDACTED]

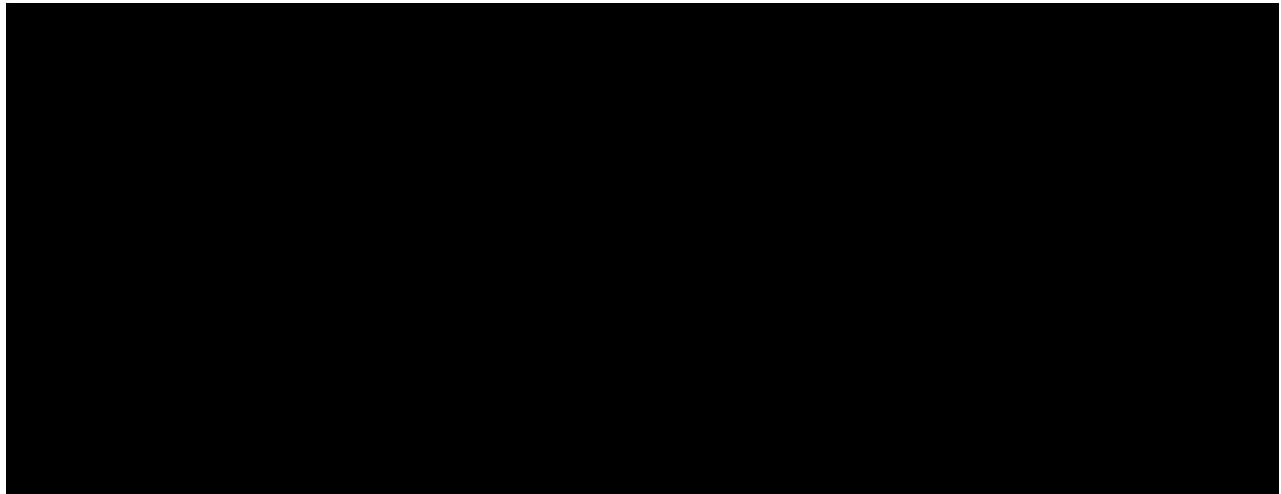
Expert Rebuttal Report of Robin S. Lee, PhD

[REDACTED]

[REDACTED]

[REDACTED]

**Figure 32.** [REDACTED]



(492) [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

\_\_\_\_\_

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]







**Errata for the February 13, 2024 Expert Rebuttal Report of Robin S. Lee, PhD**

<b>Location</b>	<b>Original Text</b>	<b>Corrected Text</b>
Paragraph 35	In this matter, the strength and importance of indirect effects for customer decisions will tend to vary across ad tech products <i>and</i> by direction	In this matter, the strength and importance of indirect <b>network</b> effects for customer decisions will tend to vary across ad tech products <i>and</i> by direction
[REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
Paragraph 176	With respect to the first point, as I explained above in Section IV.A.3, simply using two different sales channels does not equate to close substitution between them	With respect to the first point, as I explained above in Section IV.A.4, simply using two different sales channels does not equate to close substitution between them
Paragraph 257	Paragraph 257 is formatted as a paragraph.	For clarity, Paragraph 257 is a block quote from the document cited in footnote 417. For convenience, no change is made to the paragraph numbers.
[REDACTED]	[REDACTED] [REDACTED].	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
Heading IV.E.3	<b>IV.E.3</b> A single market for all ad tech products obscures rather than illuminates the relevant competition	Heading IV.E.3 should read as corrected: “ <b>IV.F.1</b> A single market for all ad tech products obscures rather than illuminates the relevant competition”
Heading IV.E.4	[REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED]

Heading IV.E.5	[REDACTED]	[REDACTED]
Heading IV.F	<b>IV.F</b> Relevant geographic markets for publisher ad servers, ad exchanges, and advertiser ad networks	Heading IV.F should read as corrected: " <b>IV.G</b> Relevant geographic markets for publisher ad servers, ad exchanges, and advertiser ad networks"
Heading IV.F.1	[REDACTED]	[REDACTED]
Heading IV.F.2	<b>IV.F.2</b> My conclusions do not change whether the product markets are analyzed on a worldwide or US	Heading IV.F.2 should read as corrected: " <b>IV.G.2</b> My conclusions do not change whether the product markets are analyzed on a worldwide or <b>US basis</b> "
Paragraph 345	Paragraph 345 is formatted as a paragraph.	For clarity, Paragraph 345 is a block quote from the document cited in footnote 532. For convenience, no change is made to the paragraph numbers.
Paragraph 436	[REDACTED]	[REDACTED]
Paragraph 493	Paragraph number 493 is formatted as red text.	As corrected, paragraph number 493 is properly formatted as black text.
Appendix A		Appendix A begins with "In addition to the materials listed below, I incorporate by reference all materials cited within the footnotes in this report and in my initial report and the accompanying back up materials."
Appendix A.4	[REDACTED]	[REDACTED]
Footnote 363	I discuss the flaws with this market below in Section IV.G.	I discuss the flaws with this market below in Section <b>IV.F</b> .
Footnote 1022	[REDACTED]	[REDACTED]



Robin S. Lee, PhD

MARCH 8, 2024

Date